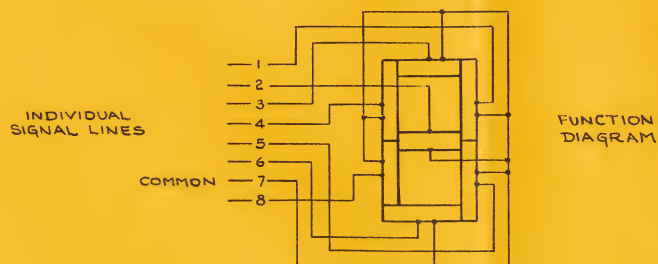


Decimal  $\pm$  .005  
Fractional  $\pm$  \_\_\_\_\_  
Angular  $\pm$   $1/2^\circ$

- 4—Remove All Burrs and Sharp Corners.....0.05.....Max.  
5—Roughness of Surfaces Not to Exceed.....63.....Microinches Rms.  
6—Symbols  $\oplus$ ,  $\ominus$  and  $\otimes$  Show that Surfaces Indicated by Arrows or  
Some Letters (e.g. (A)) Must Be Held Concentric, Square or Parallel  
Respectively Within the Limits Specified.

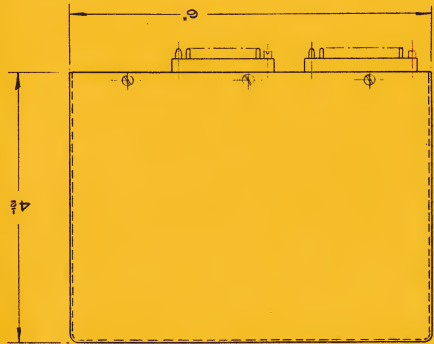
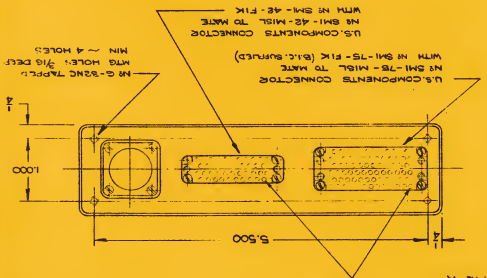


- 1.0 GENERAL DESCRIPTION - THE MODEL DN-3163 OPTICATOR IS A MINIATURE, SELF-ILLUMINATED, BRIGHT PRESENTATION, DISPLAY DEVICE, WITHOUT STORAGE CAPABILITIES. IT IS DESIGNED FOR COMPATIBILITY WITH DIGITAL DEVICES AND COMPUTERS HAVING CONTINUOUS OUTPUT SYSTEMS.
- 2.0 ELECTRICAL CHARACTERISTICS
  - 2.1 INPUT VOLTAGE: SEE TAB.
  - 2.2 CURRENT PER SEGMENT: SEE TAB.
  - 2.3 POWER PER SEGMENT: SEE TAB.
  - 2.4 ELECTRICAL CHARACTERISTICS ARE APPLICABLE ONLY TO NORMAL SUPPLY VOLTAGE AND NORMAL ROOM AMBIENT TEMPERATURES.
- 3.0 OPTICAL CHARACTERISTICS
  - 3.1 SEGMENT INTENSITY
    - 3.1.1 NORMAL INTENSITY - LIGHT INTENSITY OF ILLUMINATED SEGMENTS AT RATED VOLTAGE: SEE TAB.
    - 3.1.2 REDUCED INTENSITY - LIGHT INTENSITY MAY BE REDUCED BY REDUCING THE APPLIED D.C. VOLTAGE.
  - 3.2 CONTRAST
    - 3.2.1 RATIO OF ILLUMINATED SEGMENT TO ADJACENT BACKGROUND - 100:1 MINIMUM
    - 3.2.2 RATIO OF ILLUMINATED SEGMENT TO UNILLUMINATED SEGMENT - 100:1 MINIMUM.
  - 3.3 VIEWING ANGLE
    - 3.3.1 ALL CHARACTERS RECOGNIZABLE AT AN ANGLE OF  $\pm 45^\circ$  FROM BOTH THE HORIZONTAL AND VERTICAL CENTERLINE.
  - 3.4 STYLE
    - 3.4.1 NUMERALS ARE FORMED BY A SEVEN SEGMENT FORMAT OF STRAIGHT BARS.
- 4.0 MECHANICAL CHARACTERISTICS
  - 4.1 TWO HOLES ARE PROVIDED FOR EXTRACTION FROM A PANEL DISPLAY.
  - 4.2 REPLACEABLE LAMP BLOCK ASSEMBLY.
  - 4.3 MATERIAL AND FINISH
    - 4.3.1 HOUSING: ALUMINUM BLACK ANODIZED PER MIL-A-8625.
    - 4.3.2 CONNECTOR: BLACK DIALYL PL PER MIL-M-14.
    - 4.3.3 CONTACTS: PHOSPHOR BRONZE GOLD PLATED.
    - 4.3.4 HARDWARE: NON-CORROSIVE MATERIALS
- 5.0 ENVIRONMENTAL
  - 5.1 ALTITUDE: PER MIL-E-5272C, PROCEDURE VI, CONDITION F.
  - 5.2 SHOCK: PER MIL-E-5272C, PROCEDURE V.
  - 5.3 VIBRATION: PER MIL-E-5272C, PROCEDURE XII, CURVE A.
  - 5.4 HIGH TEMPERATURE: PER MIL-E-5272C, PROCEDURE II.
  - 5.5 LOW TEMPERATURE: PER MIL-E-5272C, PROCEDURE I.
  - 5.6 HUMIDITY: PER MIL-E-5272C, PROCEDURE I.
  - 5.7 FUNGUS: PER MIL-E-5272C, PROCEDURE I.
  - 5.8 SAND AND DUST: PER MIL-E-5272C, PROCEDURE I.

DN-3163

A

[illegible]

[illegible][illegible]

NOTES:

DATE	DESCRIPTION	APPROVAL
11/1/65	ADD S/N A	RD
11/1/65		RD

[illegible]



U.S. COMPONENTS CONNECTOR #SM1-75-MISL

U.S. COMPONENTS CONNECTOR #SM1-42-MIS

ON DN-3170 (X<sub>1</sub>) = NORTH  
(X<sub>2</sub>) = SOUTH  
ON DN-3171 (X<sub>1</sub>) = EAST  
(X<sub>2</sub>) = WEST

— NOTE THAT ON DN3171, DN3168, THIS PIN BECOMES SPARE

DRAWING NO.  
DN3172  
SHEET 2 OF 2

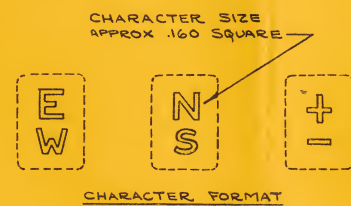
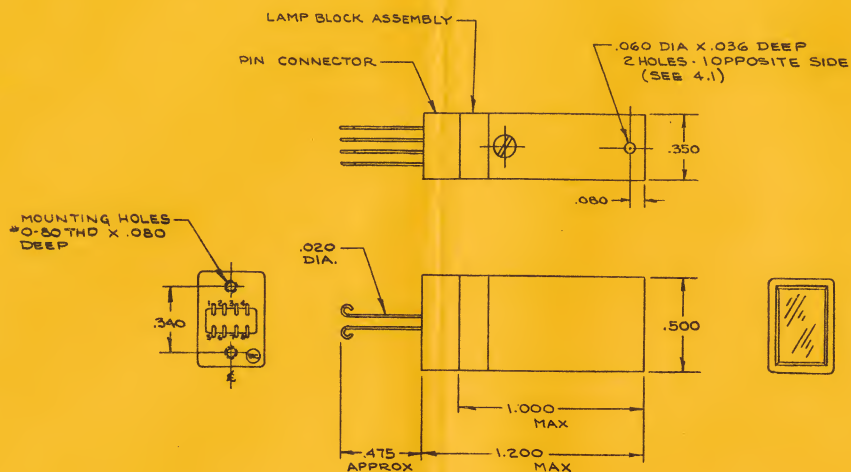
[illegible]

UNLESS OTHERWISE SPECIFIED

- 1-Do Not Scale Drawings.
- 2-Thread Length Dimensions Are for Full Threads.
- 3-Tolerances on Dimensions (Including Holes)

Decimal: .005  
Fractional:  
Angular:  $\pm 1/2^\circ$

- 4-Remove All Burrs and Sharp Corners. .005 Max.
- 5-Roughness of Surfaces Not to Exceed .63 Microinches Rms.
- 6-Symbols  $\oplus$ ,  $\ominus$  and  $\odot$  Show that Surfaces Indicated by Arrows or Some Letters (e.g. (A)) Must Be Held Concentric, Square or Parallel Respectively Within the Limits Specified.
- 7-



INDIVIDUAL  
SIGNAL LINES

- 1
- 2 UPPER CHARACTER
- 3 UPPER CHARACTER
- 4
- 5 LOWER CHARACTER
- 6 LOWER CHARACTER
- 7 COMMON
- 8

FUNCTION  
DIAGRAM

NOTES:

- 1.0 GENERAL DESCRIPTION - THE MODEL DN-3176 OPTICATOR IS A MINIATURE, SELF-ILLUMINATED, BRIGHT PRESENTATION, DISPLAY DEVICE, WITHOUT STORAGE CAPABILITIES. IT IS DESIGNED FOR COMPATIBILITY WITH DIGITAL DEVICES AND COMPUTERS HAVING CONTINUOUS OUTPUT SYSTEMS.
- 2.0 ELECTRICAL CHARACTERISTICS
  - 2.1 INPUT VOLTAGE: SEE TAB
  - 2.2 CURRENT PER CHARACTER: SEE TAB
  - 2.3 POWER PER CHARACTER: SEE TAB
  - 2.4 ELECTRICAL CHARACTERISTICS ARE APPLICABLE ONLY TO NORMAL SUPPLY VOLTAGE AND NORMAL ROOM AMBIENT TEMPERATURES.
- 3.0 OPTICAL CHARACTERISTICS
  - 3.1 CHARACTER INTENSITY
    - 3.1.1 NORMAL INTENSITY - LIGHT INTENSITY OF ILLUMINATED CHARACTER AT RATED VOLTAGE: SEE TAB
    - 3.1.2 REDUCED INTENSITY - LIGHT INTENSITY MAY BE REDUCED BY REDUCING THE APPLIED D.C. VOLTAGE.
  - 3.2 CONTRAST
    - 3.2.1 RATIO OF ILLUMINATED CHARACTER TO ADJACENT BACKGROUND - 100:1 MINIMUM
    - 3.2.2 RATIO OF ILLUMINATED CHARACTER TO UNILLUMINATED CHARACTER - 100:1 MINIMUM.
  - 3.3 VIEWING ANGLE
    - 3.3.1 ALL CHARACTERS RECOGNIZABLE AT AN ANGLE OF  $\pm 45^\circ$  FROM BOTH THE HORIZONTAL AND VERTICAL CENTERLINE.
  - 3.4 EACH CHARACTER IS ILLUMINATED BY TWO LAMPS.
- 4.0 MECHANICAL CHARACTERISTICS
  - 4.1 TWO HOLES ARE PROVIDED FOR EXTRACTION FROM A PANEL DISPLAY.
  - 4.2 REPLACEABLE LAMP BLOCK ASSEMBLY.
  - 4.3 MATERIAL AND FINISH
    - 4.3.1 HOUSING: ALUMINUM BLACK ANODIZED PER MIL-A-8625.
    - 4.3.2 CONNECTOR: BLACK DIALYL PER MIL-M-14.
    - 4.3.3 CONTACTS: PHOSPHOR BRONZE GOLD PLATED.
    - 4.3.4 HARDWARE: NON-CORROSIVE MATERIALS
- 5.0 ENVIRONMENTAL
  - 5.1 ALTITUDE: PER MIL-E-5272C, PROCEDURE VI, CONDITION F.
  - 5.2 SHOCK: PER MIL-E-5272C, PROCEDURE V.
  - 5.3 VIBRATION: PER MIL-E-5272C, PROCEDURE XII, CURVE A.
  - 5.4 HIGH TEMPERATURE: PER MIL-E-5272C, PROCEDURE II.
  - 5.5 LOW TEMPERATURE: PER MIL-E-5272C, PROCEDURE I.
  - 5.6 HUMIDITY: PER MIL-E-5272C, PROCEDURE I.
  - 5.7 FUNGUS: PER MIL-E-5272C, PROCEDURE I.
  - 5.8 SAND AND DUST: PER MIL-E-5272C, PROCEDURE I.

DN-3176

A

MODEL	CHARACTER	INPUT VOLTAGE	CURRENT PER CHARACTER	POWER PER CHARACTER	CHARACTER INTENSITY
DN-3176-9	PLUS-MINUS	4 VDC	142 MILLIAMPS	568 MILLIWATTS	800 MIN AVG FOOT-LAMBERTS
DN-3176-8	NORTH-SOUTH	4 VDC	142 MILLIAMPS	568 MILLIWATTS	800 MIN AVG FOOT-LAMBERTS
DN-3176-7	EAST-WEST	4 VDC	142 MILLIAMPS	568 MILLIWATTS	800 MIN AVG FOOT-LAMBERTS
DN-3176-6	PLUS-MINUS	4 VDC	132 MILLIAMPS	528 MILLIWATTS	400 MIN AVG FOOT-LAMBERTS
DN-3176-5	NORTH-SOUTH	4 VDC	132 MILLIAMPS	528 MILLIWATTS	400 MIN AVG FOOT-LAMBERTS
DN-3176-4	EAST-WEST	4 VDC	132 MILLIAMPS	528 MILLIWATTS	400 MIN AVG FOOT-LAMBERTS
DN-3176-3	PLUS-MINUS	4 VDC	106 MILLIAMPS	424 MILLIWATTS	200 MIN AVG FOOT-LAMBERTS
DN-3176-2	NORTH-SOUTH	4 VDC	106 MILLIAMPS	424 MILLIWATTS	200 MIN AVG FOOT-LAMBERTS
DN-3176-1	EAST-WEST	4 VDC	106 MILLIAMPS	424 MILLIWATTS	200 MIN AVG FOOT-LAMBERTS

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DR BY JON 7/6/65		DATE 7/6/65		BOWMAR INSTRUMENT CORPORATION CODE 98479 FORT WAYNE, INDIANA	
CK BY		DATE		ORIGINAL MODEL S.O. 812	
APD BY		DATE		NAME OPTICATOR	
APPROVAL JAN 7/6/65		SCALE		MATERIAL	
CHG. LET.		REVISION		DATE BY CK.	
PROTECTIVE FINISH		HEAT TREAT			
CHG. LET.		REVISION		DATE BY CK.	

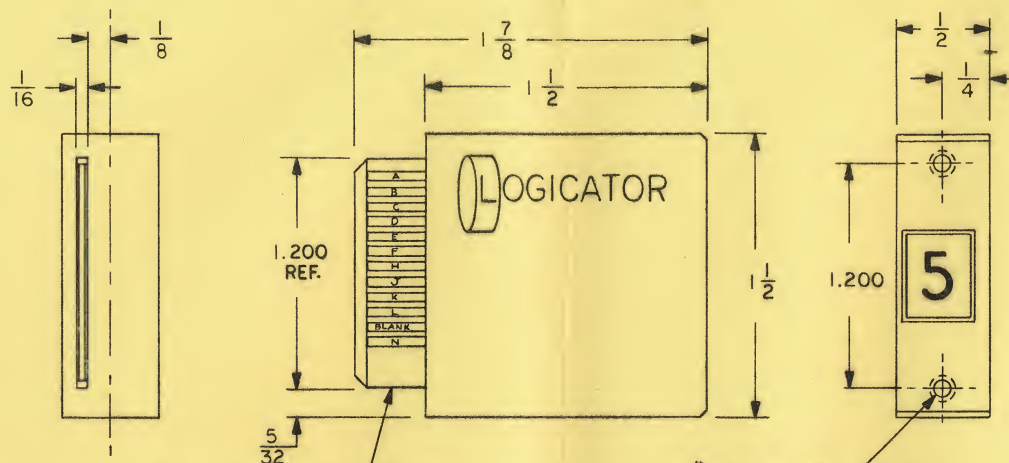
DN-3176



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# REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL



P.C. BOARD TO MATE WITH KM-14S  
WINCHESTER CONNECTOR

\*4-40-NC THD.  
MAX SCREW ENTRY  $\frac{3}{16}$

## DRUM MARKINGS

NO.	PIN
0	A
1	B
2	C
3	D
4	E
5	F
6	H
7	J
8	K
9	L
	GND - N

## NOTES:

- 1.0 GENERAL
- 1.1 A FAST RESPONDING DISPLAY UNIT WHICH IS PULSE-ACTUATED BY AN EXTERNALLY SUPPLIED ELECTRICAL DRIVE LOGIC. INTRINSIC MEMORY MAGNETICALLY RETAINS THE READOUT DRUM IN POSITION UNTIL A NEW PULSE IS APPLIED.
- 2.0 ELECTRICAL
- 2.1 VOLTAGE: +24V DC
- 2.2 POWER: 2.5 WATTS NOMINAL
- 2.3 OPERATING TEMPERATURE RANGE: -20°C TO +71°C
- 2.4 PULSE TIME: 500 MILLISECONDS
- 2.5 INPUTS: 10 PLUS COMMON
- 2.6 DUTY CYCLE: 50%
- 2.7 INSULATION RESISTANCE: 1,000 MEGOHMS MINIMUM WITH 500V DC APPLIED BETWEEN WINDINGS AND CASE.
- 2.8 HIGH POTENTIAL: 500V, 60 CPS RMS
- 3.0 MECHANICAL
- 3.1 CHARACTERS: STYLE PER MS 33558-ASG, 9/32 INCH HIGH AND NORMAL WIDTH, WHITE ON BLACK BACKGROUND.
- 3.2 VIEWING ANGLE:  $\pm 35^\circ$
- 3.3 WEIGHT: 1.5 OZ.
- 3.4 CASE: DULL BLACK

DRAWING NO.  
DN 3177

ITEM	REQD	PART NO.	DESCRIPTION	MATL	MATL SPEC	UNIT WT
LIST OF MATERIAL						

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS $\pm \frac{1}{32}$ DECIMALS $\pm .005$ ANGLES $\pm 1^\circ$		CONT NO.		LOGICATOR	BOWMAR INSTRUMENT CORPORATION 8000 BLUFFTON RD. FORT WAYNE, INDIANA
DO NOT SCALE THIS DRAWING		DRAWN BY <i>RAH</i> DATE <i>16 JUN 65</i>			
MATERIAL		APPROVED MFG DATE			
NEXT ASSY USED ON		CHECKED BY DATE APPD ENGRS DATE			
APPLICATION		SCALE		UNIT WT	DRAWING NO. DN 3177
					CODE 99479 SHEET OF